

Level 1 Validation Certificate



This document verifies that the Level 1 Validation process was completed. The session details and audit review outcomes are included here.

This certificate is required for submission – alongside the Level 1 validated water audit software file – to the California Department of Water Resources.

Call Date: 9/13/2018

Water Supplier

Supplier Name:	City of American Canyon
Supplier Participants:	Terance Hodge (Water Plant Manager), Steve Hartwig (outgoing Public Works Director)

Key Audit Metrics

Data Validity Score:	51
ILI:	0.8
Real Loss:	13.7 gal / conn / day
Apparent Loss:	8.5 gal / conn / day
Non-Revenue Water as Percent of Cost of Operating System:	3.0%

Validator

Validator:	Kate Gasner, Water Systems Optimization
Validator Qualifications:	Water Audit Validator Certificate from the AWWA California Nevada Section

Certification Statement by Validator

This water loss audit report has been Level 1 validated per the requirements of California Code of Regulations Title 23, Division 2, Chapter 7 and the California Water Code Section 10608.34.
All recommendations on volume derivation and Data Validity Grades were incorporated into the water audit. ☒

Level 1 Validation – Water Supplier Confirmation

This document confirms participation in and endorsement of the Level 1 Validation as completed.

This acknowledgement is required for submission – alongside your Level 1 validated water audit software file – to the California Department of Water Resources.

Water Supplier Name:

City of American Canyon

Water Supplier Public Water System ID:

2810005

Water Audit Period:

1/2018 – 12/2018

Water Audit & Water Loss Improvement Steps

Steps taken in the audit period timeframe to increase data source accuracy, reduce real losses, and/or reduce apparent losses, as informed by the water audit.

Click or tap here to enter text.

Certification Statement by Water Supplier Executive:

This water loss audit report meets the requirements of California Code of Regulations Title 23, Division 2, Chapter 7 and the California Water Code Section 10608.34 and has been prepared in accordance with the method adopted by the American Water Works Association, as contained in their manual, *Water Audits and Loss Control Programs, Manual M36, Fourth Edition* and in the Free Water Audit Software version 5.

Executive Name (print):

Terance Hodge

Executive Position:

Water Systems Manager

Signature:



Date

10/1/2018

[Click to access definition](#)
[Click to add a comment](#)Water Audit Report for: **City of American Canyon (2810005)**
Reporting Year: **2018**
1/2018 - 12/2018

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input data by grading each component (n/a or 1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades.

All volumes to be entered as: **ACRE-FEET PER YEAR**

WATER SUPPLIED

To select the correct data grading for each input, determine the highest grade where the utility meets or exceeds all criteria for that grade and all grades below it.

Volume from own sources:	+	?	3	2,621,287	acre-ft/yr
Water imported:	+	?	3	98,787	acre-ft/yr
Water exported:	+	?	n/a	0.000	acre-ft/yr
WATER SUPPLIED: 2,720,074					
acre-ft/yr					

Enter grading in column 'E' and 'J' ----->

+	?	3	+	?	3
+	?	3	+	?	3
+	?	3	+	?	3

Value: Pcnt: Use buttons below for help using option buttons to select percentage of water supplied OR value

Click here: ?

AUTHORIZED CONSUMPTION

Billed metered:	+	?	6	2,575,597	acre-ft/yr
Billed unmetered:	+	?	n/a	0.000	acre-ft/yr
Unbilled metered:	+	?	n/a	0.000	acre-ft/yr
Unbilled unmetered:	+	?	5	6,800	acre-ft/yr
2,582,397					
acre-ft/yr					

WATER LOSSES (Water Supplied - Authorized Consumption)

137,677

acre-ft/yr

Apparent Losses

6,800

acre-ft/yr

Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed

39,222

acre-ft/yr

Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed

6,439

acre-ft/yr

52,461

acre-ft/yr

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses:

85,215

acre-ft/yr

WATER LOSSES:

137,677

acre-ft/yr

NON-REVENUE WATER

NON-REVENUE WATER:

144,477

acre-ft/yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	+	?	5	104.1	miles
Number of active AND inactive service connections:	+	?	8	5,532	conn./mile main
Service connection density:	?	?	?	53	conn./mile main
Average length of customer service line?	+	?	?	Yes	(length of service line, beyond the property boundary, that is the responsibility of the utility)
Average length of customer service line has been set to zero and a data grading score of 10 has been applied	?	?	?	68.0	psi
Average operating pressure:	+	?	3	68.0	psi

COST DATA

Total annual cost of operating water system:	?	?	10	\$6,544,127	\$/Year
Customer retail unit cost (applied to Apparent Losses):	+	?	9	\$5.87	\$/100 cubic feet (ccf)
Variable production cost (applied to Real Losses):	+	?	5	\$710.25	\$/acre-ft
Use Customer Retail Unit Cost to value real losses					

WATER AUDIT DATA VALIDITY SCORE:

*** YOUR SCORE IS: 51 out of 100 ***

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

- 1: Volume from own sources
- 2: Customer metering inaccuracies
- 3: Billed metered



AWWA Free Water Audit Software: System Attributes and Performance Indicators

WAS v5.0
American Water Works Association
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Water Audit Report for: **City of American Canyon (2810005)**

Reporting Year: **2018** **1/2018 - 12/2018**

***** YOUR WATER AUDIT DATA VALIDITY SCORE IS: 51 out of 100 *****

System Attributes:

Apparent Losses:	52,461	acre-ft/yr
+ Real Losses:	85,215	acre-ft/yr
= Water Losses:	137,677	acre-ft/yr

? Unavoidable Annual Real Losses (UARL): 106.10 acre-ft/yr

Annual cost of Apparent Losses: \$134,143

Annual cost of Real Losses: \$60,524

Valued at **Variable Production Cost**

Return to Reporting Worksheet to change this assumption

Performance Indicators:

Financial:

Non-revenue water as percent by volume of Water Supplied:	5.3%
Non-revenue water as percent by cost of operating system:	3.0%

Real Losses valued at Variable Production Cost

Operational Efficiency:

Apparent Losses per service connection per day:	8.47	gallons/connection/day
Real Losses per service connection per day:	13.75	gallons/connection/day
Real Losses per length of main per day*:	N/A	
Real Losses per service connection per day per psi pressure:	0.20	gallons/connection/day/psi

From Above, Real Losses = Current Annual Real Losses (CARL): 85.22 acre-feet/year

? Infrastructure Leakage Index (ILI) [CARL/UARL]: 0.80

* This performance indicator applies for systems with a low service connection density of less than 32 service connections/mile of pipeline



AWWA Free Water Audit Software:

System Attributes and Performance Indicators

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Water Audit Report for: **City of American Canyon (2810005)**

Reporting Year: **2018** **1/2018 - 12/2018**

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System Attributes:

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Apparent Losses per service connection per day: **8.47** gallons/connection/day

Real Losses per service connection per day: **13.75** gallons/connection/day

Real Losses per length of main per day*: **N/A**

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From Above, Real Losses = Current Annual Real Losses (CARL): **85.22** acre-feet/year

? Infrastructure Leakage Index (ILI) [CARL/UARL]: **0.80**

* This performance indicator applies for systems with a low service connection density of less than 32 service connections/mile of pipeline

AWWA Free Water Audit Software: Water Balance

Water Audit Report for: **City of American Canyon (2810005)**

Reporting Year: 2018

Data Validity Score: 51

Water Exported		Billed Water Exported				Revenue Water	
0.000						0.000	
Own Sources (Adjusted for known errors)	System Input 2,720.074	Authorized Consumption 2,582.397	Billed Authorized Consumption 2,575.597	Billed Metered Consumption (water exported is removed)		Non-Revenue Water (NRW)	
				2,575.597			
			Unbilled Authorized Consumption 6.800	Billed Unmetered Consumption			2,575.597
				0.000			
				Unbilled Metered Consumption			
				Unbilled Unmetered Consumption		0.000	
				Unauthorized Consumption		6.800	
				Customer Metering Inaccuracies		6.800	
				Systematic Data Handling Errors		39.222	
				Leakage on Transmission and/or Distribution Mains		6.439	
		Leakage and Overflows at Utility's Storage Tanks					
		Not broken down					
		Leakage on Service Connections					
		Not broken down					
Water Imported		Water Losses	Real Losses				
98.787		137.677	85.215				



AWWA Free Water Audit Software: Dashboard

WAS v5.0
American Water Works Association
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The graphic below is a visual representation of the Water Balance with bar heights proportional to the volume of the audit components

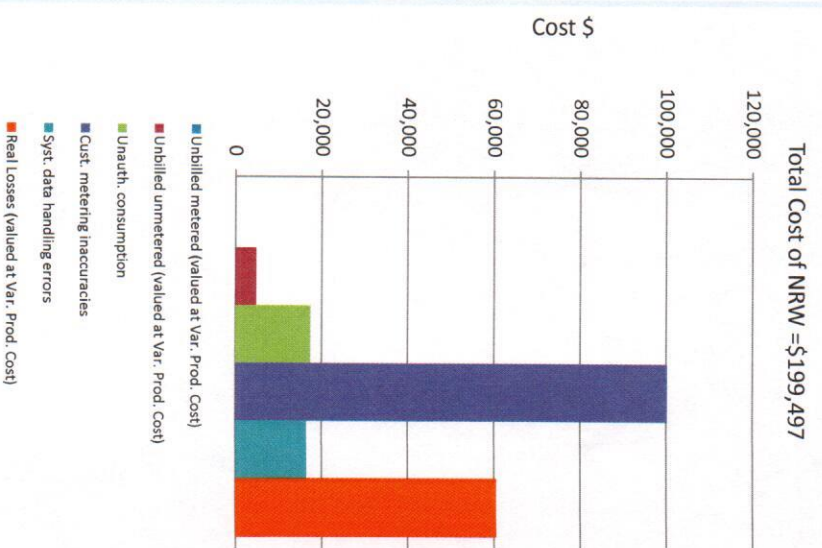
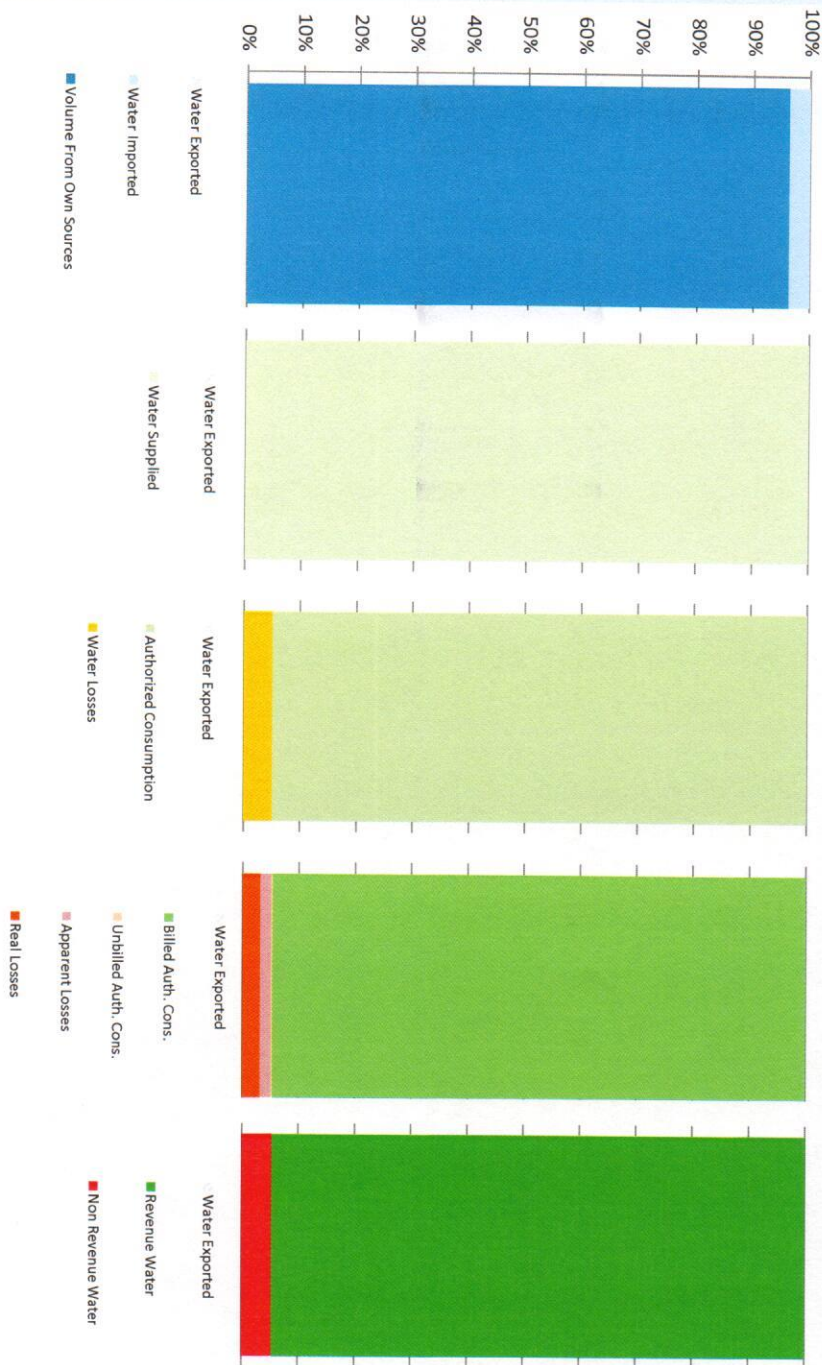
Water Audit Report for: City of American Canyon (2810005)

Reporting Year: 2018

1/2018 - 12/2018

Data Validity Score: 51

- ☐ Show me the VOLUME of Non-Revenue Water
☒ Show me the COST of Non-Revenue Water



Level 1 Validation Summary Notes

This document includes detailed notes about utility practices as reviewed during third-party level-one water audit validation.

This document is not a required submission to the California Department of Water Resources. It is meant to provide background and documentation of the validation process.



Call Information

Utility

Utility Name: City of American Canyon
Utility Participants: Terance Hodge (Water Plant Manager), Steve Hartwig (outgoing Public Works Director)
Call Date: 9/13/2019

Validator

Validator: Kate Gasner, Water Systems Optimization
Validator Qualifications: Water Audit Validator Certificate from the AWWA California Nevada Section

Validation Call Notes

Audit Input

Grade

Audit Input Notes

Volume from Own Sources

3

Source Meter Profile: Untreated water is supplied from the north bay aqueduct through two influent meters to the water treatment plants (mag meters). This value informs the total Volume from Own sources for this audit.
Derivation: Manual reads from production meters as archived.
Comments: Input derivation from supporting documents confirmed. Exclusion of non-potable volumes confirmed.

Data Validity Grade Notes

Approximate Percent of Volume Metered: 100%
Approximate Percent Tested and/or Calibrated: 100%
Calibration Frequency: None.
Volumetric Testing Frequency: None.
Volumetric Testing Method: n/a
Comments: Note that influent meters are the only metered volumes available: water use at the plant (though some of it is cycled) is not currently measured nor accounted for here.

Volume from Own Sources
Master Meter and Supply
Error Adjustment

3

Derivation: Left blank in absence of available test data.
Change in Storage Considered: No.
Comments: Three tanks 2.5MG, 3MG, 0.2 MG exist within the distribution system. The change in volume during the audit period is expected to be minimal.

Source Meter Read Method: One meter (newer) continuously reading and another locally stores information, once a month downloaded and transferred. Additionally, manual reads taken.
Source Meter Read Frequency: Daily.
Data Review Practices: Each business day.
Real-Time Storage Level Monitoring: One at the plant is monitored others are not.

Water Imported

3

Import Meter Profile: Three import connections: two exist with City of Vallejo (one of which was recently replaced) and another exists with City of Napa.
Derivation: Totalization of volumes per redundant meter reads by utility.

Comments: Input derivation from supporting documents confirmed. Exclusion of non-potable volumes confirmed.

Approximate Percent of Volume Metered: 100%
Approximate Percent Tested and/or Calibrated: None
Calibration Frequency: None
Volumetric Testing Frequency: n/a
Volumetric Testing Method: n/a
Comments: Vallejo bills monthly; Napa bills only as used (sometimes comes on automatically).

Water Imported Master Meter and Supply Error Adjustment	3	Derivation: : Left blank in absence of available test data. Comments: No additional comments.	Import Meter Read Method: Manual. Import Meter Read Frequency: Daily logs provided. Data Review Practices: Review occurs upon billing (quarterly for Vallejo, intermittently for Napa depending on use. Comments: Limiting factor for DVG is frequency of review and lack automatic logging.
Water Exported	n/a	Export Meter Profile: No exports occurred in 2018. Comments: n/a	Approximate Percent of Volume Metered: n/a Approximate Percent Tested and/or Calibrated: n/a Calibration Frequency: n/a Volumetric Testing Frequency: n/a Volumetric Testing Method: n/a Comments: n/a
Water Exported Master Meter and Supply Error Adjustment	n/a	Derivation: n/a Comments: n/a	Export Meter Read Method: n/a Export Meter Read Frequency: n/a Data Review Practices: n/a Comments: n/a
Billed Metered Authorized Consumption	6	Derivation: Springbrook billing database report. Customer Meter Profile: Read Frequency: Monthly. Reading Technology: AMR, upgrading to AMI. Age Profile: Majority between 0-10 years. Meter replacement program based on age threshold of 12 years. New project to replace entire current customer meters' stock with AMI meters. Comments: Lag-time correction is not employed in input derivation. Input derivation from supporting documents confirmed. Exclusion of non-potable volumes confirmed. Plans to transition to an AMI meter reading system with Sensus.	Approximate Percent Metered: 100% Small Meter Testing Practices: Reactive - complaint based or flagged-consumption testing only. Number of Small Meters Tested: Not quantified but known to be small. Large Meter Testing Practices: Reactive - complaint based or flagged-consumption testing only. Except for Coca-Cola's meter, which is tested annually. Number of Large Meters Tested: 3-4/ year General Replacement Practices: Based on a 12-year age threshold. Billing Data Review: Standard billing QC, plus review of volumes by use type each billing cycle. Comments: No additional comments.
Billed Unmetered Authorized Consumption	n/a	Profile: n/a Derivation: n/a Comments: n/a	Policy for Metering Exemptions: n/a Comments: n/a
Unbilled Metered Authorized Consumption	n/a	Profile: n/a Derivation: n/a	Policy for Billing Exemptions: n/a
Unbilled Unmetered Authorized Consumption	5	Profile: Operational flushing and fire department usage. Comments: Flushing activities greatly scaled back due to drought. Custom California default of 0.25% x WS utilized.	Comments: Default grade applied. Note that 2019 flushing activities increased.

Unauthorized Consumption	5	Comments: Default input applied.	Comments: Default grade applied.
Customer Metering Inaccuracies	3	Derivation: Rudimentary estimate. Comments: No additional comments.	Customer Meter Testing: Routine (proactive), but not fully representative. Customer Meter Replacement: Routine (proactive), but limited. Comments: No additional comments.
Systematic Data Handling Errors	5	*See BMAC comments regarding meter testing & replacement activities. Comments: Default input applied.	Comments: Default grade applied.
Length of Mains	5	Derivation: Totaled from paper based map. Hydrant Laterals Included: Uncertain. Comments: No additional comments.	Map Format: Paper. Asset Management Systems: Not currently in place. Map Update Process: Accomplished through normal work order processes. Comments: Currently validating infrastructure data in the field; next year will have better verified information. GIS system will be built of verified information.
Number of Service Connections	8	Derivation: Standard report run from billing system. Basis for Query: Meter ID - non-premise based. Comments: No additional comments.	Field Validation: Accomplished through normal meter reading processes. Estimate of Error: 2%. Comments: No additional comments.
Average Operating Pressure	3	How Pressure is Maintained: 5 pressure zones are used to maintain pressure in the system. Pressure Range: 50 - 70 PSI Derivation: Calculated as weighted average from analysis of field data (hydrant pressure readings). Comments: No additional comments.	Pressure Data Collection: Hydrant pressures taken at select hydrants a couple times each year. Real-Time Monitoring: No real-time monitoring currently in place. Hydraulic Model: Not aware of one in use. Comments: No additional comments.
Annual Operating Cost	10	Derivation: From official financial reports. Value calculated using an average from financial reports across fiscal years. Comments: Confirmed costs limited to water only, and water debt service included.	Auditing Practices: Annually by a third-party CPA. Comments: No additional comments.
Customer Retail Unit Cost	9	Rate Structure: Tiered structure with different rates for customer classes. Plans to move towards a higher percentage of revenue from fixed fees. Derivation: Weighted average based on consumption by each rate. Sewer charges are based on water meter readings. Sewer revenues are not incorporated into calculation. Comments: No additional comments.	M36 Review: Input calculations have not been reviewed by an M36 water loss expert. Comments: No additional comments.

Variable Production Cost	5	<p>Primary Costs: Own sources and import supply. Secondary Costs: None currently included. Comments: No additional comments.</p>	<p>M36 Review: Primary costs only. Input calculations have not been reviewed by an M36 water loss expert. Comments: No additional comments.</p>
Infrastructure & Water Loss Management Practices:			
Infrastructure age profile: The oldest mains are more than 60 years old.			
Infrastructure replacement policy (current, historic): Several miles of main were replaced in 2018.			
Estimated main failures/year: 10 mains leaks / year (2017 estimate, no data provided for 2018)			
Estimated service failures/year: 20 service failures primarily on copper connections in corrosive soils (2017 data, no updates provided for 2018)			
Extent of proactive leakage management: The system is surveyed every year for leaks by listening to all the service connections. As of Sept 25, 2018, 60 leaks had been found in 2018.			
Other water loss management comments: The utility notes that the soil is corrosive and to combat this composite (PVC) service connections are now being installed instead of copper.			